



Original article

Timing of First Sexual Intercourse and Young Adult Health Outcomes

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A B S T R A C T

Purpose: To examine how age of onset of sexual intercourse is associated with past-year and lifetime sexually transmitted infections (STIs) and depression in young adulthood.**Methods:** We examined how occurrence of a lifetime and past-year STI, lifetime diagnosis of depression, and past-week depressive symptoms differed as a function of age of onset of sexual intercourse using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health; N = 8,938 individuals). Time-varying effect models were used to examine how age of onset, measured as continuous age, was associated with these outcomes in young adulthood, with all analyses stratified to examine gender differences.**Results:** Individuals who engaged in first intercourse before age 16 reported higher than average rates of all outcomes studied; for example, an estimated 35% of women and 12% of men who initiated at age 14 years reported a lifetime STI, compared with about 5% of those who initiated at age 24 years. Timing of first intercourse past the mid-twenties was associated with lower than average rates of STIs and lifetime depression diagnoses but was associated with a somewhat higher level of past-year depressive symptoms. Patterns were similar by gender, although there was little difference in men's depression diagnoses by age of onset.**Conclusions:** Results suggest that sexual intercourse before age 16 years may be associated with higher rates of STIs and depression. Findings provide support for comprehensive programs that both promote delay of first intercourse and provide safe sex and psychological support for those who initiate early.

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IMPLICATIONS AND
CONTRIBUTION

Early sexual behavior is associated with negative health outcomes, but it is less clear what ages of initiation are problematic. Results suggest that intercourse before age 16 years is associated with STIs and depression, with mixed findings for later ages. Programmatic efforts to delay first intercourse and promote safe sex are warranted.

Early sexual intercourse is associated with negative physical and mental health outcomes, such as sexually transmitted infections (STIs) and depressive symptoms. Studies have found higher rates of STIs in individuals who engage in early

(definitions ranging from ages 13 to 16 years) sexual intercourse [1–4]. Possible explanations include biological factors, more years of sexual activity to accumulate a greater number of partners, and riskier young adult sexual behavior (e.g., condom nonuse, higher risk partners) among early initiators [2,5,6]. Similarly, associations between early sexual intercourse and increased depressive symptoms have been documented, particularly among adolescent girls [7,8]. One explanation, according to life course theory [9], is that experiencing life transitions during periods that are “off-time” relative to peers may lead to distress. The stronger associations for adolescent girls compared with boys may be influenced by internalized norms about the

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inappropriateness of sexual behavior for women, by women's greater tendency to engage in sex to please a partner, or by conflict or breakups with sexual and romantic partners [7,10–12]. Less is known about how later timing may be associated with health outcomes. Because late onset of sex is also “off-time,” individuals who initiate sex at later ages may feel more distressed about their lack of sexual experience. This may be especially true for men, as research has suggested that sexual prowess is a critical component of masculinity that is tied to well-being [13]. One study found that late initiation of intercourse is associated with poorer sexual functioning for men, suggesting the possibility that both early and late sexual initiation may be problematic for adult health [4]. Prevention efforts to delay sexual intercourse do not generally address potential negative outcomes of late initiation, and thus more information about how specific timing of sexual initiation may be associated with different outcomes is necessary.

Most studies of this topic have grouped individuals into early, normative, or late timing by either choosing cutoff ages based on unspecified criteria or assessing timing relative to peers in the sample (e.g., upper or lower age of onset quartiles, *z* score cutoffs). Although intuitive, this leads to different definitions across studies, which makes it difficult to interpret the body of evidence as a whole; for example, definitions of “early” sexual behavior range from before age 13 years [1] to before age 16 years [7,8]. However, because age of onset has typically been studied with age groups, the “lumping” of ages into categories may obscure or attenuate associations that may be better represented as a function of continuous time. Consistent with prior research, one study that assessed age of onset as a continuous variable documented greater prevalence of STI in young adulthood for individuals who initiated early compared with later; for example, those who initiated at age 10 years had an estimated 10% probability of a past-year STI, compared with 7% of those who initiated at 16% and 4% of those who initiated at age 20 years [2]. However, this study did not examine the effect of initiation after age 20 years or examine associations with mental health, making it unknown whether later initiation may be associated with poorer psychological functioning. In addition, this study examined the linear effect of time, which may obscure more nuanced changes.

A new analytic approach, the time-varying effect model (TVEM; [13,14]), has been used to examine outcomes as functions of continuous age of onset of a behavior, enabling researchers to empirically determine during which ages initiation of a behavior is a particular risk. For example, one study found that initiating smoking before age 20 years was associated with increased odds of dependence in young adulthood and that the risk of later dependence was highest for individuals who began smoking at age 10 years [15]. However, no study has applied this sort of flexible approach to examine outcomes of age of initiation of sexual behavior. In this study, we apply TVEM to data from a large, nationally representative study to empirically determine which ages of onset of sexual intercourse are associated with higher risk of STIs and depression in young adulthood (defined here as ages 24–34 years) and how these trends may differ by gender.

Methods

Participants and procedures

Data are from the contractual sample of the National Longitudinal Study of Adolescent to Adult Health (Add Health),

a longitudinal study of individuals recruited from schools when they were in 7th–12th grade in 1994–1995 (Wave I) [16]. Follow-up in-home interviews occurred during 1995–1996 (Wave II), 2001–2002 (Wave III), and 2007–2008 (Wave IV). Data collection was approved by the Public Institutional Review Board at the University of North Carolina, and we received approval from the Penn State Institutional Review Board for secondary analysis. Because our focus is the effect of timing of first intercourse, we included individuals who had first engaged in sexual intercourse by Wave IV (94% of participants) and had data about timing of first intercourse and the Wave IV outcomes. In addition, we included only individuals from the core sample, which was designed to be a representative sample of the school-age population at that time and is essentially self-weighting [16]. Our resulting sample contained 8,938 individuals (55% female, 45% male; 65% white, 8% black, 11% Latino, 3% Asian, 3% other race, *M* age at Wave IV = 28.9 years, standard deviation = 1.8).

Measures

Timing of first intercourse was assessed using items from Waves I–IV. We included participants' report of first intercourse from the earliest wave sex was reported, as the recall of events, including first intercourse, has been found to be more accurate when less time has passed between the event and the assessment [17]. At Waves I and II, participants reported if they had ever engaged in sexual intercourse, followed by questions about the month and year it occurred; age at first sex in years was calculated from this information and interview date. At Waves III and IV, participants were asked if they ever engaged in vaginal intercourse, followed by a question about the age (in years) when it occurred. To be consistent across waves, we used age in years as the time metric. At all waves, intercourse was defined as when “a man inserts his penis into a woman's vagina.” The mean age of first intercourse was 16.51 (standard deviation = 2.9); 23% of individual had sex before age 15 years, 66% between 15 and 20 years, and 10% after age 20 years.

We examined lifetime and past-year STI infection at Wave IV when individuals were aged 24–34 years. Participants reported whether they had been diagnosed with six different STIs (chlamydia, gonorrhea, trichomoniasis, syphilis, genital herpes, and genital warts), in their lifetime, and whether this diagnosis occurred in the past year. Composite variables indicating diagnosis with any of these STIs were created (0 = not diagnosed, 1 = diagnosed). Similarly, we examined lifetime and past-week indicators of depression from Wave IV. For the lifetime measure, participants reported whether they had ever received a diagnosis of depression (0 = no diagnosis, 1 = received diagnosis). For the past-week measure, participants completed an eight-item scale of past-week depressive symptoms drawn from the Center for Epidemiological Studies Depression Scale [18]. Items were rated on a scale from 0 to 3 (“never or rarely” to “most or all of the time”), during the past 7 days.

We controlled for age at Wave IV, race/ethnicity measured with four dichotomous indicators (black, Latino, Asian, and other; white as reference group) and whether or not an individual had been sexually abused before first intercourse (since prior literature suggests that this predicts early initiation [19]). The sexual abuse variable was calculated from three Wave IV items about whether an individual had been touched in a sexual way, forced to have sex by a parent or caregiver, or forced into any type of sexual activity by anyone other than a parent, followed by

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